and the black types. Pairs belong sometimes to one type, very often to two different types; generally the young are completely black or completely white.

M. Giard gave an account of his researches on some controverted points in the embryogeny of the Ascidians, more especially *Molgula socialis*, which he has studied in the zoological laboratory of Wimereux. He has been able to supplement and correct in several respects the conclusions of previous observers. M. Giard also, after long research into the embryogeny of animals belonging to the various classes into which Cuvier divided the *Articulata* and *Mollusca*, proposed another limitation of these two groups. Another paper by the same was concerned with the embryogeny of the pectinibranchiate *Gasteropoda*.

Prof. Sirodot described in detail the results of his researches on Elephants. M. Sirodot remarked that, having had at his disposal a very large number of teeth, he had been able not only to correct the errors committed by Falconnet and De Blainville, but, moreover, to feel confident that the different species of *Elephas* hitherto described as closely allied to the Mammoth have no value whatever. There are a multitude of intermediate forms connecting the *Elephas primigenius* with *Elephas indicus*.

M. Lortet, while in Syria, made some investigations into the organisation and reproduction of fibrous sponges. He has been able to prove the presence and to follow the formation of the male and the female egg. Apart from these genital products, he did not meet, in the sponges which he examined, any other cellular element. M. Lortet did not observe, moreover, any canals running into the great canal of the ovule, canals referred to by a large number of zoologists. M. Lortet also described his observations on the very peculiar fauna of the Lake of Tiberias. This fauna appears to indicate a former communication between the waters of the lake and those of the sea.

Physics.—M. Cornu indicated a very simple process for determining with accuracy the focal distance and the principal points of lenses.

M. Merget explained the very interesting results of his researches on the thermo-diffusion of porous and humid pulverulent bodies. A thermo-diffuser is generally a porous vessel, filled with an inert powder, in the middle of which is a glass tube or a metallic tube riddled with holes. On heating such an apparatus, after having moistened it, steam is disengaged in abundance through the porous substance, while dry air traverses the apparatus in an inverse direction, and escapes by the tube. If this escape be prevented, there is produced a pressure which reached three atmospheres at a dull red heat. If the pulverulent mass or the porous body ceases to be moist, no gas escapes. The author did not explain the fact, but he showed that the explanation of it given by M. De la Rive cannot be accepted. M. Merget is convinced that there is here a thermo-dynamic phenomenon. Thermo-diffusion must play an important part in the gaseous exchanges of vegetable life; the author showed this by taking a leaf of *Nelumbium* as a thermo-diffuser.

M. Gripon communicated to the Section and repeated various experiments which he had performed with films of collodion. In receiving upon a Savart polariscope light polarised by a lamina of collodion, we have there systems of fringes, one normal, the other due to phenomena of secondary interference. By illuminating a film of collodion with the light reflected by a second film, we easily obtain fringes of interference, as in the experiment of Brewster. Collodion films are very diathermanous for luminous heat; they are less so for dark heat.

M. Mascart showed some very curious experiments on the condensation resulting from the expansion of moist air. If a little water is placed in the bottom of a perfectly clean flask, closed by a glass tube terminated by an indiarubber syphon bag, we have a closed space, which soon becomes saturated with moisture. By pressing on the bag the temperature rises, and there can be no condensation. But by allowing the bag to resume, by its elasticity, its original form, the air expands, is consequently cooled, and, contrary to what is usually observed, no condensation takes place. To produce the condensation ordinarily observed, it is sufficient to introduce into the flask some unfiltered air, while filtered air produces no effect. In the same way very beautiful clouds are obtained by introducing a little tobacco smoke, or gases resulting from any kind of combustion. These experiments may be of some use in explaining the formation of clouds.

M. Deprez presented an ingenious electric chronograph, intended to estimate by the graphic method intervals of time extremely small, as the duration of a shock.

M. Cornu explained his experiments on the rate of light, by the method of M. Fizeau. (See NATURE, vol. xi. p. 274).

Dr. Moreau explained some points in his investigations on the swim-bladder of fishes, and showed particularly that in proportion as a fish sinks the effort which it must make diminishes.

M. Dufet read a paper on his researches into the electric conductibility of pyrites.

In the Section of *Geology* and *Mineralogy*, most of the papers referred to local topics. Of those of general interest we mention the following:—M. Henry Dufet described his experiments on the thermic conductibility of certain schistose rocks, from which he drew some interesting conclusions regarding the deformations of the fossils contained in such rocks. M. Charles Vélain read a paper on his exploration of the islands of St. Paul and Amsterdam, while on the expedition for observing the Transit of Venus. M. Lory presented some considerations on the dislocation of rocks in mountainous countries.

Botany.—In this section M. Sirodot gave an account of his researches on the classification and development of *Batrachospermum*, and M. de Lanessan spoke on the floral organogeny of *Zostera*.

M. J. Chatin described the results of his histological and histogenic researches on the interior leaf glands and some analogous productions. After having studied the mode of formation of the structure of these various organs in many families, he draws the following conclusions:—1. The interior leaf glands originate always in the mesophyll. 2. These glands are formed by differentiation from a cellule in which multiplication by division is rapidly produced, so that except in some Lauraceæ the gland is always formed, in its perfect state, from a cellular mass, more or less considerable. 3. The products of secretion are constantly forming in the cellules proper of the gland. 4. The elements of the latter are re-absorbed from the centre to the circumference, and thus form a reservoir where the product of secretion is amassed. 5. In certain plants, and by an analogous phenomenon, there may be formed in the leaf true secreting canals. 6. The leaf-glands are almost constantly situated in the vicinity of the fibro-muscular bundles. 7. In many plants there exist at different points of the stalk, of the branches, and of the petioles, certain productions on the whole comparable to the interior leaf-glands.

M. Merget gave the result of his researches on the interchange of gases between plants and the atmosphere. He concluded with the following statements:—1. The means by which the interchange of gases is effected in plants are the stomata and accidental openings; it is by diffusion in the stomata, and not by dialysis through the cuticle, that exterior gases penetrate into the interior of a plant, and that internal gases escape. 2. The entry of atmospheric gases is due to the action of the physical force produced by the phenomena of gaseous thermo-diffusion. M. Merget concluded by some interesting details on the function of chlorophyll.

M. Baillon read a very interesting communication on the Amentaceæ.

In the Section of *Anthropology*, we note the following papers:—Dr. Lagneau read a careful and elaborate memoir on the ethnogeny of the populations of the N. W. of France, in which he reviewed the various peoples which have contributed to the formation of the former and present population of the region comprised between the sea, the Saône, and the Loire.—M. Chauvet read a report relative to the excavations undertaken by the Archæological Society of Charente, in the tumuli on a woody plateau near a Roman road, and entered into details of a nature to clear up certain controverted points of prehistoric archæology. From the objects found in these explorations, M. Chauvet develops a doctrine according to which there was no gap between the various civilisations from an industrial point of view.

As usual, a very large number of papers belong to the Section of Medical Sciences; some of these are of more than merely technical interest, but our space prevents us from referring to them in detail. A full report of the proceedings will be found in the *Revue Scientifique* for August 28 and following weeks.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.—DETROIT MEETING

THE American Association for the Advancement of Science held its twenty-fourth annual meeting at Detroit, Mass., from Aug. 11 to 17 inclusive. Some of

its previous meetings have surpassed this one in respect to the number of members present, but none can be regarded as superior to it in the general excellence of the communications presented. The causes of the slight falling off in attendance may be briefly mentioned. The cities of the Atlantic sea-board where local scientific societies have been longest in existence, and where a large proportion of the membership of the Association is resident, are 750 to 1,000 miles, chiefly eastward, from Detroit. That city, on the boundary line between the United States and Canada, is also considerably to the northward of the larger centres of population in the Western States. Thus, then, the assembling at Detroit required, in the great majority of instances, a long, tedious, and rather expensive journey. It need not be concealed that, owing to the widespread effects of the depression in all branches of business in the United States—extending even to the learned professions—the pecuniary means of members were in many cases more restricted than usual; and this fact in many cases decided adversely the question of attendance at the meeting.

A protracted series of discussions in that and previous years resulted at the meeting of 1874 in the Association's adopting a new constitution, which first displayed its general effects at Detroit. The two prominent features of change were modelled upon the system of the British Association. A division was made between Fellows and the rest of the members, prominence or usefulness in science being required for election to the honours of Fellowship. This elective process did not, however, apply to the Fellows who became such between the meetings at Hartford and Detroit, and consequently many have been admitted to the dignity who have no claim to it by scientific labours. To the Fellows rather than to the general membership, the guidance and management of the Association is confided. The effect of this change was very apparent at Detroit in the exclusion of a large number of communications which would easily have passed the ordeal of committees and been read at the meetings of previous years. The chosen remainder reached a higher average of excellence than has been hitherto attained, and in the section of Physics, Mathematics, and Chemistry, the weeding process so reduced the number of communications that the supply gave out before the close of the meeting; but this may also be accounted for by the fact that the sub-section of Chemistry, for the first time organised and separately at work, much facilitated the dispatch of business in Section A. A variety of concurrent causes presented a like result from being reached in Section B, devoted to Geology and Biology. The geologists are always largely in force when the Association meets west of the Alleghanies, the development of the mining resources of the newer States and Territories rendering their labours of immediate economic interest and value. There was an extraordinary accession of ethnological papers, prompted chiefly by numerous discoveries recently made in new and very thorough explorations of Indian mounds. The great injuries which the food crops of the United States have suffered from insects within a year or two, called forth several papers of merit from the leading entomologists, as well as much debate and some action on the part of the Association. Besides all the foregoing subjects, there was an unusual number of papers on specific investigations in natural history. These were largely the fruit of the seed sown at the Anderson School on Penikese Island, by the lamented Agassiz. The pupils there instructed, mostly for the first time, in observing the habits of animals, dissecting their forms and studying their differences, were from all parts of the Union. Nearly all of them are teachers in high schools and the smaller colleges. Having been thus started on the path of original investigation, they already find something new to relate, and their papers had a charm of freshness, very different from those of older members who have found their own easier grooves of thought and lapsed into routine.

Another important feature introduced at this year's meeting by the new constitution, resulted from the election of two vice-presidents, who were the presiding officers respectively of Sections A and B. Following in this respect the system of the British Association, each of these officers opened his Section with an address, in which a department of science was made the subject of a broad survey. Hitherto the address of the retiring President has been the only one at each meeting of this character; the change gives two such addresses in addition, and may in future years give a greater number. At the Detroit meeting the address of Prof. John L. Le Conte, of Philadelphia, the retiring President, brought forward in a general way the aid to a knowledge of past conditions on the globe, which might be derived from a study of existing forms. Prof. Le Conte's own lines of investigation have been more especially confined to the study of insects, and from the facts thus derived he drew most of his illustrations. He regards organic life as furnishing everywhere evidences of design, and a principal portion of the address was devoted to deprecating the conflict between science and religion, and to urging patience rather than controversy. Prof. H. A. Newton, the astronomer, of Yale College, delivered the opening address of Section A. He urged the study of pure mathematics as a basis for work in all the sciences; adducing, through a wide range of illustration, the evidences of its value in advancing knowledge. The want of a thorough knowledge of the higher mathematics he regarded as a frequent defect among American men of science, while their dependence upon mathematical methods in all branches of investigation was every day becoming more absolute.

The address of Prof. J. W. Dawson, Principal of McGill College, Montreal, before Section B, was one of the most important given at the meeting. He is well known as the most able and prominent anti-Darwinian in America. His address took the form of a discussion of the question, "What do we know of the origin and history of life on our planet?" Space will not permit an analysis of this address, which reviewed the evidence furnished by the Silurian fossils at great length, regarding it as inconclusive when applied to the support of evolution theories. Prof. Dawson vigorously opposed the hypothesis that organic life is a product of mere physical forces.

Thus the weight of utterance in two of the addresses is adverse to Darwinian theories, but this is no index to the general sentiment of the leading students of biology in the Association. The officers chosen for next year include names noted in connection with the advocacy of the most advanced evolutionary doctrines. The venerable President-elect, Prof. Wm. B. Rogers, of Boston, was, in years gone by, the most successful antagonist, in discussions of the new theories, that Prof. Agassiz encountered in America. Prof. Edward S. Morse, Vice-president-elect, of Section B, has attained prominence in the expression of strong Darwinian views before large popular audiences in almost every city of the United States. Prof. Charles A. Young, of Dartmouth College, well known by his spectroscopic researches on the sun's chromosphere, was elected Vice-president to preside over Section A. It is a somewhat remarkable circumstance that six out of eight of the officers for next year are residents of the New England States, the three highest positions falling to their share. The citizens of Detroit did everything in their power to make the visit of the Association pleasant. Several social entertainments and excursions by boat and rail were provided, and the Detroit Scientific Association aided materially in these hospitalities. The next meeting will be held August 23, 1876, at Buffalo.* W. C. W.

* Next week we shall refer to some of the principal papers in detail.